Executive Council. Four years—Dr. Charles W. Dodge, University of Rochester; Principal Henry Pease, Medina High School; Professor W. C. Peckham, Adelphi College, Brooklyn. Three years—Dr. J. McKeen Cattell, Columbia University, New York; Professor LeRoy C. Cooley, Vassar College, Poughkeepsie; Professor E. R. Whitney, Binghamton High School. Two years—Professor Irving P. Bishop, Buffalo Normal School; Mr. Charles N. Cobb, Regents' Office, Albany; Professor C. S. Prosser, Union University, Schenectady. One year—Professor Albert L. Arey, Rochester Free Academy; Professor R. E. Dodge, Teachers' College, New York; Professor T. B. Stowell, Potsdam Normal School.

FRANKLIN W. BARROWS,
Secretary.

MIGRATION OF BATS ON CAPE COD, MASSACHUSETTS.

BAT migration has received little attention. Various writers have made vague reference to the fact that certain bats are found in winter at localities where they are not known to breed, but no detailed account of the migratory movements of any species has yet been published. The only special paper on the subject that I have seen is by Dr. C. Hart Merriam,* who clearly establishes the fact that two North American bats migrate. The data on which this conclusion rests are as follows: The hoary bat, one of the migratory species, is not known to breed south of the Canadian fauna. In the Adirondack region it appears about the middle of May and disappears early in October. During the autumn and winter it has been taken in South Carolina (Georgetown, January 19th), Georgia (Savannah, February 6th), and on the Bermudas† ('autumn'). As the writer remarks, these facts may be fairly regarded as conclusive evidence of migration. The evidence of the migratory habits of the silver-haired bat rests chiefly on the animal's periodical appearance in spring and fall at the lighthouse on Mount Desert Rock, thirty miles off the coast of Maine. This species has also been observed on the Bermudas.

In August and September, 1890 and 1891, I had the opportunity to watch the appearance and disappearance of three species of bats at a locality where none could be found during the breeding season. Highland Light, the place where my observations were made, is situated near the edge of one of the highest points in the series of steep bluffs of glacial deposit which form the outer side of Cape Cod, Massachusetts. The light, which is less than ten miles from the northern extremity of the cape, is separated from the mainland toward the east and northeast by from twenty-five to fifty miles of water. The bluff on which it stands rises abruptly from the beach to a height of one hundred and fifty feet. I found the bats for the most part flying along the face of this bluff, where they fed on the myriads of insects blown there by the prevailing southwest winds. They chiefly frequented the middle and upper heights and seldom flew over the beach at the foot of the bluff or over the level ground about the lighthouse. I do not know where the animals spent the day, as careful search in old buildings, under the overhanging edge of the bluff, and in deserted bank swallow holes, failed to reveal their hiding places. It is possible that they found shelter in the dense, stunted, oak scrub with which the bluff is in many places crowned, but of this I have no evidence. I hope that the observations given below may again call the attention of field naturalists to a subject which presents many difficult and interesting problems.

ATALAPHA NOVEBORACENSIS* (RED BAT).

August 21, 1890. The first bats of the season were seen this evening. There were

*Trans. Royal Soc. Canada V (1887), Section V, p. 85, 1888.

† I may add that I have a bat of this species, killed at Brownsville, Texas, on October 22d.

*With bat nomenclature in its present unsettled state it is well to use the names adopted by Dr.

only two, and I could not positively identify them, but they were probably red bats.

August 25, 1890. An adult male taken.

August 28, 1890. Two seen.

August 29, 1890. The evening was too chilly for many bats to be on the wing. A few *A. noveboracensis* seen and two taken.

August 30, 1890. Six or eight *A. noveboracensis* seen and three taken. The evening was warm and bats flew much more freely than on the 29th.

August 31, 1890. A chilly evening again, and only two bats seen, both *A. noveboracensis*.

September 2, 1890. A few red bats seen and two taken.

September 5, 1890. I was not at Highland Light this evening, but Mr. W. M. Small reported a heavy flight of bats. He shot five, all *A. noveboracensis*.

September 8, 1890. Heavy fog, so that no bats could be seen, if any were moving along the face of the bluff. Three or four red bats flew about the light house tower during the first half of the night, feeding on insects attracted by the light. They flew mostly below the level of the deck which encircles the tower about six feet below the lantern and never approached the light itself.

September 12, 1890. A single red bat shot this evening.

After this date I watched for bats on several consecutive evenings. As I saw no more I concluded that the migration had ended.

August 25, 1891. Fourteen *Atalapha noveboracensis*, the first bats of the season, seen this evening. They were flying both north and south.

August 26, 1891. Evening very foggy. A red bat which flew about the lighthouse was the only one seen.

August 27, 1891. Half a dozen red bats seen and one taken.

August 28, 1891. Four red bats seen. All flew toward the south.

August 30, 1891. A red bat caught in a house near the edge of the bluff.

September 2, 1891. Eight or ten seen and three taken. The movement this evening was mostly, though not wholly, from north to south.

September 3, 1891. Six seen and three taken.

September 5, 1891. Evening cold and misty. No bats moving.

September 7 and 8, 1891. A few bats seen each evening, but none taken. All appeared to be this species.

September 10, 1891. One red bat shot.

September 11, 1891. One seen.

September 12, 1891. One killed. About a dozen bats seen, but how many were of this species, and how many *Lasionycteris noctivagans* I could not determine.

September 13, 1891. About a dozen bats seen. Two of these were certainly red bats.

After this date I watched for bats on consecutive evenings for more than a week. As I saw none I finally gave up the search.

ATALAPHA CINEREA (HOARY BAT).

August 26, 1890. One *Atalapha cinerea*, the only bat seen, shot this evening.

August 28, 1890. Two hoary bats taken, and at least two, and probably four, others seen.

August 30, 1890. Two taken and two others seen.

September 2, 1890. Only two seen. Both taken.

No more hoary bats seen during 1890.

August 25, 1891. A single *Atalapha cinerea* seen flying south along the face of the bluff this evening.

September 2, 1891. One seen flying north.

September 12, 1891. An adult male shot—the last of the season.

Harrison Allen in his latest Monograph of the Bats of North America (1893), although many of these will require revision.

At Highland Light I found the hoary bat less active and irregular in its movements than the red bat. Its large and comparatively steady flight made it easier to shoot than either of the two smaller species with which it was associated. It began to fly immediately after sunset. In the Adirondacks Dr. C. Hart Merriam found the hoary bat a late flyer, and an exceeding difficult animal to kill on account of its swift, irregular motions.* It is possible that while on Cape Cod the animal modifies its habits on account of the unusual surroundings in which it finds itself. The fatigue of a long migration might also have an appreciable effect on a bat's activity.

LASIONYCTERIS NOCTIVAGANS (SILVER-HAIRED BAT).

September 1, 1890. One silver-haired bat taken.

September 2, 1890. Four taken and perhaps a dozen others seen.

The silver-haired bat was not seen again during 1890.

September 10, 1891. Three shot and probably half a dozen others seen. They were mostly flying north.

September 11, 1891. Two shot and four or five more seen.

September 12, 1891. About a dozen bats seen. Some were without doubt this species, but just what proportion I could not tell.

While September 12th is the latest date at which I have seen *Lasionycteris noctivagans* at Highland Light, I have a specimen killed there by Mr. W. M. Small on October 28, 1889.

GERRIT S. MILLER, JR.

ZOOLOGICAL NOTES.

MUSEUMS AND SCIENCE.

THE recently published report of the 1896 meeting of the Museums Association of Great Britain shows how much interest is taken and thought bestowed in rendering museums instructive and attractive to the public. The most interesting of the eleven papers read, however, is one from the sharp-pointed pen of Mr. F. A. Bather, dealing with the scientific rather than the popular side of museums, and entitled 'How May Museums Best Retard the Advance of Science?' Chief among these is "that jealousy with which a museum curator should guard the precious specimens entrusted to his care, forbidding the profane hands of the mere anatomist ever to disturb them in their holy rest." This is a well-aimed shaft, for specimens have no value save for the information to be extracted from them, and yet, in too many cases, they are regarded as fetishes and, like *Spirula* and *Notoryctes*, carefully bottled up with the probability that they will eventually go to pieces without yielding up any information. Another point on which Mr. Bather dwells at some length is the "idea of keeping certain collections separate according as they happen to have belonged to some person with a lengthy name * * * or to have been presented by some individual who laid it down in his will that his specimens were to be known for all eternity as the 'Peter Smith Collection.'" This is a matter that was touched on by Dr. Goode in his principles of Museum Administration, and, as he says, "the acceptance of any collection, no matter how important, encumbered by conditions, is a serious matter, since no one can forsee how much these conditions may interfere with the future development of the museum." Fortunately, the bequests received by the larger museums of the United States are practically unhampered. Other methods of impeding the progress of science are noticed, such as striking dullness through the hearts of thousands by funeral rows of stuffed birds with their melancholy Latin names, and, as Mr. Bather says, much may be done if a museum will keep its material carefully to itself. On the question of

* Trans. Linn. Soc. New York, II, p. 78–83. 1884.